Pathway to Independence Award for Outstanding Early Stage Postdoctoral Fellows (K88/R00)

Cancer Training Branch, Center for Cancer Training

NATIONAL CANCER INSTITUTE

July 9, 2018
K Awards Are Effective for Transition to Independence

89% of NCI K99/R00 Awardees (2008 – 2012) applied for R01s, 52% succeeded

- K99 is successful but doesn’t meet the needs of early-stage postdocs who can transition to independence early
- The F32 fellowship serves early-stage postdocs but has been overtaken by the K99 as a direct pathway to independence
A New Transition Award is Needed for Early-Stage Postdocs

- A significant number of outstanding early-stage postdocs, mostly from data, population and behavioral sciences, get tenure-track positions after 1-2 years of postdoctoral training
- They are not competitive for current K awards, which target those with 4-8 years of research experience and a substantial publication record
- They are therefore disadvantaged compared with peers who had K transition awards
  - No protected time from teaching
  - No assurance of a competitive startup package
  - Takes longer to get first R01 (~6 yrs) than K99/R00 awardees (~3 yrs)
Two Discipline-Specific RFAs

- **Population and Behavioral Sciences (PBS), 8 awards/year**
  - Cancer control research to understand the causes and distribution of cancer in populations, to support the development and delivery of effective interventions, and to monitor and explain cancer trends
  - Includes behavior, healthcare delivery, surveillance, health disparities, and epidemiological/biostatistical research

- **Data Science (DS), 8 awards/year**
  - An interdisciplinary field of inquiry in which quantitative and analytical approaches, processes, and systems are developed and used to extract knowledge and insights from increasingly large and/or complex sets of data
  - Includes cancer informatics, genomics, precision oncology, data integration and visualization, systems biology, artificial intelligence and machine learning
  - Open to epidemiology & biostatistics PIs *only if they are developing analytics*
Goals of the New Transition Award, K88/R00

- Support the transition to independence of those who can get tenure track positions sooner
  - Bonus: further reduce the time between independence and their first R01

- Establish a primary pipeline for future NCI PIs with individual K Awards
  - Establishes NCI’s individual K Award portfolio as the primary pipeline for transitioning to independence
  - Gives NCI more control over the supply of future PIs by adjusting the number of K awards
  - Highlights a path to success for trainees interested in pursuing independent cancer research careers
Key Features of the K88/R00

- **Eligibility** – outstanding postdocs with no more than 2 years’ research experience
  - Postgraduate clinical training not counted against the 2-year cap
  - Non-US citizens may apply

- **Institutional Nomination Letter** – required
  - Affirm PI’s readiness to transition and commit to supporting the PI’s search for a tenure track position no later than one year after the award
  - Describe the nominee selection process
    - Limit # of nominees per institution (DCCPS RPGs now support 175 institutions)

- **R00 phase at a different Institution** – Strongly encourage the R00 phase to be conducted at an institution different from the K88 phase

- **Dual Phase Transition Award** – up to 2 years’ support for the mentored phase followed by 3 years funding for the independent phase
Strategic Elements of the RFAs

- Review criteria to address recommendations made by Alberts, Hyman, Pickett, Tilghman, and Varmus in *Science*, 2018. **360** (6390):716-718
  - Applicant’s readiness to transition within two years
  - Publications from postdoctoral training are not required
  - Evaluate creativity and potential of research to launch and sustain a career rather than extensive preliminary data
  - Career development plan that prepares the applicant for independent research career

- Applications to be reviewed by a K88-specific SEP
  - Early-stage postdocs do not compete well with later-stage applicants for K awards, due to their relatively lower postdoc productivity
  - One Receipt Date per year
Budget and Period of Support

- RFAs to be issued annually for 5 years, beginning in FY19
  - Anticipated # of applications: ~100 per year total for both RFAs
  - Anticipated # of awards: 16 per year (8 per RFA)
  - Provide Salary, Fringe Benefits, and Research Support

### Cost per Awardee by Year

<table>
<thead>
<tr>
<th></th>
<th>K88-Year 1</th>
<th>K88-Year 2</th>
<th>R00-Year 1</th>
<th>R00-Year 2</th>
<th>R00-Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Salary</strong></td>
<td>Up to $100 K</td>
<td>Up to $100 K</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>F&amp;A @28%</strong></td>
<td>Up to $28 K</td>
<td>Up to $28 K</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Research Support</strong></td>
<td>$30 K</td>
<td>$30 K</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>8% Indirect Costs</strong></td>
<td>$13 K</td>
<td>$13 K</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total Cost By Year</strong></td>
<td>$171 K</td>
<td>$171 K</td>
<td>$249 K</td>
<td>$249 K</td>
<td>$249 K</td>
</tr>
</tbody>
</table>

### Annual Cost per Cohort of 16

<table>
<thead>
<tr>
<th></th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>K88 Phase</td>
<td>$2.7 M</td>
</tr>
<tr>
<td>R00 Phase</td>
<td>$4.0 M</td>
</tr>
</tbody>
</table>
**Cumulative Cost for 16 Awards**

<table>
<thead>
<tr>
<th>Award Phase/Year</th>
<th>FY19</th>
<th>FY20</th>
<th>FY21</th>
<th>FY22</th>
<th>FY23</th>
</tr>
</thead>
<tbody>
<tr>
<td>K88 year 1</td>
<td>$2.7 M</td>
<td>$2.7 M</td>
<td>$2.7 M</td>
<td>$2.7 M</td>
<td>$2.7 M</td>
</tr>
<tr>
<td>K88 year 2</td>
<td>$2.7 M</td>
<td>$2.7 M</td>
<td>$2.7 M</td>
<td>$2.7 M</td>
<td>$2.7 M</td>
</tr>
<tr>
<td>R00 year 1</td>
<td></td>
<td>$4.0 M</td>
<td>$4.0 M</td>
<td>$4.0 M</td>
<td>$4.0 M</td>
</tr>
<tr>
<td>R00 year 2</td>
<td></td>
<td>$4.0 M</td>
<td>$4.0 M</td>
<td>$4.0 M</td>
<td>$4.0 M</td>
</tr>
<tr>
<td>R00 year 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>$4.0 M</td>
</tr>
<tr>
<td>Total Cost</td>
<td>$2.7 M</td>
<td>$5.4 M</td>
<td>$9.4 M ($4.0 M)</td>
<td>$13.4 M ($8.0 M)</td>
<td>$17.4 M ($12.0 M)</td>
</tr>
</tbody>
</table>

*K88 cost is paid by CCT Funds; R00 cost is paid by RPG*
Evaluation Criteria (S=short-term, M=mid-term, L=long-term)

- Distribution of applications by RFA, institution, & clinical trials (S, K88 as control)
- Successful transition to tenure-track research positions (S, K99 awardee as control)
- Dialog with reviewers to improve the RFAs annually (S)
- Evaluate nomination limits → desired # of applications for each RFA (S)
- Elicit feedback from awardees & mentors at conferences (á la F99) (S, M)
- Productivity & bibliometrics (S, M, L, unsuccessful K88 applicants as control)

- Time to first R01 submission & award (M, L, unsuccessful K88s and K99 as controls)
- Evaluate shifts within cancer disciplines and expansion into other research areas (M, L, K99 as control)
- Promotion & tenure outcomes, # of RPG submissions & awards (L)
Long-Term Goals of K Portfolio

- Offer a cohesive K portfolio
  - Focus is the transition to independence
  - Target trainees by degree type & career stage
  - Align with CTB’s mission to support training for all areas of cancer research

- Eventually merge K88 RFAs and include all cancer disciplines
  - Allow time for population, behavioral, and data sciences to establish strong K88 roots
  - Support the stars from basic/translational/clinical fields who are not well served by K99
    - Reduce their time to independence & first R01

- Balance the supply of ESI PIs from K portfolio to match extramural demand
Why Create a New Activity Code?

- K99/R00 is an NIH-wide brand with an established target audience
  - CTB wants to attract a different audience (early-stage postdocs) while leveraging the power of the R00

- Establishing a K88 brand provides visibility to early-stage postdocs who seek independent research careers
  - Creates an effective marketing tool

- K88 (but not the K99) can redirect early stage postdocs from the F32 path
  - K awards have overtaken the F32 as a direct route to independence

- New K88 activity code allows us to easily track outcomes
  - Reducing the time to 1st R01, age at 1st R01, shifts in scientific disciplines
CTB’s Current Individual K Portfolio

~95% of current K portfolio applicants have 3 or more years of postdoc experience at the time of application

**K08:** For clinician scientists at all career stages; 95% have 5+ years post-degree experience

**K22:** 2-8 years postdoc research experience; 95% have 5+ years post-degree experience

**K99/R00:** Up to four years postdoc research experience (as of 2014), 95% have 3+ years post-degree experience